HISTORY

COLLEGE OF MEDICINE

1958-1968

CHAPTER 20

DEPARTMENT OF RADIOLOGY

Sidney W. Nelson, M.D.
Professor and Chairman
Department of Radiology

Department of Radiology
History for Decade 1958-1968

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1958 - 1968

I. General Academic History

A. Changes in department organization, teaching philosophies, methods and facilities during 1958-1968.

1. Departmental organization.

The decade from 1958 through 1968 saw enormous growth in the teaching, research, and patient care activities of the Department of Radiology. In 1958 the department consisted of the following divisions and sections:

(1) Division of Radiology

a. Section of Diagnostic Radiology.

b. Section of Therapeutic Radiology

c. Section of Radiological Physics.

d. Section of Radiologic Technology.

At the end of the decade the Radiology Department consisted of the following divisions:

(1) Division of Diagnostic Radiology.

(2) Division of Therapeutic Radiology.

(3) Cardiovascular division.

(4) Nuclear Medicine division.

(5) Ultrasonic division.

(6) Radiation Safety and Research Laboratory division.

(7) Radiologic Technology.

The many new developments in radiology necessitated the establishment of several new teaching programs in cardiovascular radiology, nuclear medicine, high energy radiation therapeutic techniques, radiation safety and ultrasonography.

During this decade new and more effective teaching methods were emphasized and many improvisations were instituted in order to make the teaching of radiology more relevant to the needs of medical students and resident physicians.

2. New outpatient diagnostic radiology facility (1958)

As the College of Medicine and University Hospitals grew, so did similar growth occur in the Radiology Department. The first major event of the decade was the opening of the outpatient radiology area in the new North Wing of the University Hospital. The acquisition of adequate facilities and space for the large numbers of outpatients who participated in the teaching program permitted them to be examined in comfortable and pleasant surroundings and with much more efficiency than was possible in the formerly used extremely crowded inpatient area of the hospital. The acquisition of these new quarters also permitted the establishment of a new Radiology Teaching Museum for medical students and residents and additional filing space for the growing numbers of radiographs used in the teaching program.

3. Opening of new radiation therapy addition (1960)

The opening of the new radiation therapy addition in 1960 resulted in the addition of splendid new teaching and patient care facilities for the many patients with cancer who were referred to the university for investigation and treatment. The acquisition of high energy equipment permitted many new techniques to be used in the treatment of cancer. The new equipment armamentarium included a 24 million electron volt Betatron, a "Theratron-B" unit and the "Eldorado" fixed beam cobalt unit, the latter two having been built and purchased from the Atomic Energy Commission of Canada. A radioactive Cesium unit was also

obtained for short distance therapy. This fine equipment made possible the teaching of new methods in cancer therapy.

4. New Children's Hospital radiological facilities. (1960)

A new Children's Hospital Radiology Department was planned during the early years of the decade and this well equipped new area was occupied in 1960. The acquisition of image amplification equipment permitted the examination of sick children with the least possible radiation, and opened up many new advanced teaching techniques for medical students and residents. This division under the leadership of Dr. William H. R. Howard and Dr. Thomas R. Frye is today one of the busiest centers of pediatric radiology in the country.

5. Assumption of university wide responsibilities for radiation safety. (1961)

The Radiology Department was asked to assume the responsibilities of the radiation safety program for the entire Ohio State University in 1961. This required a reorganization of radiation safety procedures, and under the guidance of Prof. Theodore Sopp, a new teaching manual was written, a teaching program was instituted, and the multiple teaching responsibilities were absorbed by the Radiation Safety and Research division of the Department of Radiology. This division was equipped with a Beckman Spectrophotometer, Lithium floride dosimetric equipment, ancillary facilities for utilizing computer information, and equipment for the construction of special types of X-ray apparatus used in the new teaching and patient care programs of the department.

6. Establishment of Cardiovascular Radiology division. (1962)

In 1962, due to the enormous growth and demand of teaching of cardiovascular radiology procedures, the Cardiovascular Radiology division was established under the capable direction of Dr. William Molnar. The enormous increase in the demands

for the teaching of new cardiovascular radiologic techniques resulted in the planning and construction of an entirely new and larger laboratory in the area formerly occupied by the radiation therapy section (prior to the move to the new radiation therapy addition). After the new laboratory was occupied in 1966, the teaching responsibilities of this laboratory continued to grow until by the end of the decade this laboratory under Dr. Molnars skillful direction had become one of the busiest and most productive teaching and research laboratories in the United States.

7. Development of mammography and lymphography. (1965)

The technical advances in X-ray film emulsions and tubes made possible the development of new techniques for the detection of breast cancer. After several years of diligent effort, Dr. David Dunbar perfected an excellent technique of mammography and established criteria for its use in the detection of unsuspected cancer of the breast. At the same time he established meticulous techniques for the injection of radiopaque contrast media into the lymphatic system. This technique makes it possible to detect diseases of the retroperitoneal lymphatic system when all other methods fail.

8. Establishment of a central Nuclear Medicine Laboratory. (1966)

The growth of nuclear medicine techniques (using radioactive isotopes) had been so great during the early years of the decade, that the small incompletely equipped laboratories which existed in various departments in the medical center could no longer meet the increasing demands for these valuable new teaching and investigative techniques. As a result, Dr. Doan formed a committee in 1958 to decide how to establish a new versatile central nuclear medicine laboratory. This

committee was composed of representatives from all major departments having an interest in Nuclear Medicine. After two years of deliberations, the committee asked Dr. Nelson to assume the responsibility for the creation of a central nuclear medicine laboratory. In 1966, the Department of Medicine nuclear medicine facilities, which were primarily concerned with physiological function studies, were merged with those of the Radiology Department which had been primarily concerned with the isotopic scanning techniques. The merged facilities were placed under the direction of Dr. Xavier J. Riccobono, under whose outstanding leadership this division developed an outstanding new teaching program for medical students, residents, and all others interested in utilizing these techniques. By 1968, the importance of this laboratory was reflected by its meteoric rise to one of the busiest and most productive in the United States. Much new sophisticated equipment was added including a rectilinear scanner which was the first scanning unit obtained. However, the enormous growth in teaching and patient care responsibilities soon resulted in the acquisition of an Anger Camera which permitted the recording of multiple polaroid "pictures" of an isotope as it flowed through various vascular compartments and organs of the body. This improvement in scanning techniques made possible the teaching of normal and abnormal physiological events in chronological sequence. Each polaroid picture consists of an image of the distrib ution of the chemical tagged with the radioactive isotope, the image being made possible by the composite photographic effect of the scintillation of multiple points of a large sodium crystal placed over the appropriate part of the body.

In collaboration with the O. S. U. Department of Physics and Dr. Phillip

Jastram, the Ohio State University Cyclotron was made available to Dr. William Myers for the preparation of the isotopes used in his teaching programs in Radiobiology and Nuclear Medicine, and those used in the teaching of Clinical Nuclear Medicine by Dr. Riccobono.

9. Acquisition of Hyperbaric Oxygen Therapy facility (1966).

In 1966 a hyperbaric oxygen chamber was obtained in order to institute a new form of therapy which was made possible by the previous acquisition of the high energy "Theratron-B" rotational cobalt machine. It was already known that tumor cells with an adequate oxygen supply were more sensitive to radiation than those with a deficient oxygen supply. The attainment of the desired high oxygen levels within the tumor is achieved by placing the patient in an air-tight tank, following which oxygen is forced into the tank until its pressure is approximately two to three times that of normal atmospheric pressure. After breathing this high pressure oxygen atmosphere for a few minutes, the oxygen level of the patients blood is high enough to assure that the tumor cells contain enough oxygen to make them more sensitive to the radiation, which is administered through the transparent plastic walls of the hyperbaric oxygen chamber.

10. Establishment of ultrasound laboratory. (1967)

The use of ultrasound methods were proven to be practical in the study of the structures located deep within the body where they were sometimes relatively inaccessible to direct examination. Such situations could be evaluated by the more elaborate and hazardous procedures, but since the ultrasound method was not associated with any deleterious effects or dangers, it was decided to pursue this method of investigation. As a result of Dr. Atis K. Freimanis'

capable leadership, new ultrasonic methods were devised for studying the location of midline structures in cerebral diseases. Other methods were found to be very useful in the study of liver diseases, and more recently in the study of neoplastic, vascular, and traumatic conditions of the retroperitoneal space.

11. The addition of Means Hall to University Hospitals. (1968)

The official incorporation of Means Hall into the University Hospitals in 1968 resulted in the expansion of the teaching and patient care responsibilities of the Radiology Department, as this former chest hospital with relatively limited radiological needs was converted to a general university teaching hospital with far more extensive radiological requirements. The prompt acquisition of new equipment and the remodeling and expansion of facilities was necessitated by the many new demands made of the Radiology Department.

12. The establishment of a baccalaureate program in Radiologic Technology. (1968)

Until 1958 the Radiologic Technology teaching program consisted of an 18 month course of instruction leading to a certificate. In this year the course was expanded to two years. In 1967 after several years of careful planning by Dr. Nelson, Dr. Freimanis and Mr. Robert Bullock (Chief Radiologic Technologist), a four year baccalaureate program was developed and approved by the College of Medicine curriculum committee. It is hoped that the first students for this program will be registered in the fall of 1969. This program will be administered in the School of Allied Medical Sciences, and will be an addition to the two year certificate program already in existence.

13. Changes in teaching methods. (1958-1968)

The astonishing increase in technological knowledge in all phases of Radiology made it mandatory to acquire new equipment and devise new techniques

of teaching. Image amplification equipment enabled the Radiologist to see the fluoroscopic image with much more clarity and brightness than was formally possible utilizing the ordinary fluoroscopic screens. This important advance resulted in a great saving of time for busy faculty members, because it was no longer necessary for them to wear red glasses for 15 to 20 minutes in order to accommodate for dark vision. Image amplification also made it possible to utilize new television teaching techniques for large numbers of medical students and residents who could now view normal and abnormal physiological phenomena in patients who were being examined in areas remote from the student classrooms. Thus, it was finally possible for the patient to be examined by one faculty member while another in a remote classroom could show the student what was being encountered in the sick patient.

Another significant advance which became commonplace during the decade was the recording of normal and abnormal physiological events by the use of cine-radiographic techniques. Thus, movies of many fluoroscopic-radiological procedures such as bronchography, various gastrointestinal examinations, myelography, intravascular and intracardiac injections, etc., could be prepared and used repeatedly as a permanent part of the visual teaching material in the department. The use of rapid bi-plane X-ray cameras also made it possible to record on large X-ray films the progress of radiographic contrast through the vascular system in two planes simultaneously. The addition of such improved new equipment in the cardiovascular radiology division strengthened the teaching program in this rapidly developing field.

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The rapid growth of Nuclear Medicine resulted in the acquisition of facilities and the development of new methods for the study of isotopic content of many body secretions, excretions, blood samples, etc. Also, unique radiation detectors were added to the equipment armamentarium, thus permitting simultaneous measurement of differences in the function of paired organs (such as kidneys and lungs) as they were studied by isotopic techniques. As this decade grew to a close, our faculty believed that the enormous advances which have occurred in the specialty of radiology during this decade are overwhelming in view of the national shortages of radiological faculty members. However, these advances create new challenges which will be solved in the next decade, primarily as a result of the utilization of computer techniques to achieve greater efficiency and speed for the radiology faculty members in their teaching and patient care programs. The next decade will undoubtedly see continued improvement in teaching and patient care because of the advances which were achieved during the 1958-1968 decade.

B. Teaching programs and curriculum.

1. Teaching programs, undergraduate (other than medical)

The radiology faculty participated in the following undergraduate teaching programs:

(1) Nursing #411

This instruction involved primarily the introduction of the physics and chemistry of radiation and the effects of radiation on living organisms and tissues.

(2) Pharmacy 700 (Radioisotope Tracher Techniques and Radiopharmaceuticals

This basic course is open to students from other colleges in the univ

sity and involved the use of tracer isotopes to study various biological functions in living organisms. Nursing students, veterinary medicine students, zoology students, and dietetic students were among those registering for this course.

(3) Radiologic Technology.

This was a two year certificate course given to radiologic technology students at the University Hospital. During 1967 and 1968 this course was strengthened and expanded into a four year baccalaureate program which hopefully will enroll its first students in the fall of 1969. This baccalaureate program will be administered in the School of Allied Medical Professions.

2. Teaching programs-medical

During the 1958-1968 decade several courses in Radiology were taught to medical students. Among these were the following:

(1) Physiology #646 (Radiobiology and Nuclear Medicine)

This course has been taught for 20 years by Dr. William G. Myers, who devised many demonstrations designed to elucidate many of the advances which have occurred in this rapidly expanding field.

(2) Radiology #715 (Clinical Pediatric Radiology)

(3) Obstetrics and Gynecology #737 (Obstetrical and Gynecologic Radiology)

(4) Radiology #740 (Radiological Diagnosis in Clinical Medicine)

This course aquaints the student with many of the common conditions they will encounter in the clinical practice. Seminars and lecture-demonstrations are given by the radiology faculty.

Drs. Atis K. Freimanis, David Dunbar, Alfred Stockum and Antimos Christoforidis were diligent and effective in making this an effective and popular course.

(5) Radiology #749 (Clinical Nuclear Medicine)

(6) Radiology #750 (Diagnostic and Therapeutic Radiology-Advanced) This elective is always oversubscribed. The students are given a series of challenging diagnostic X-ray problems to solve, following which their solutions are discussed with the faculty under the capable supervision of Dr. Atis K. Freimanis. The students have the opportunity to attend many seminars given by Dr. Freimanis, Dr. Dunbar, Dr. Christoforidis, Dr. Stockum and other faculty members, and each student is assigned a project on which he writes a thesis.

(7) Radiology #793 (Individual Studies)

3. Teaching programs-graduate

(1) Radiology #799 (Radiology Residency---3-4 years of formalized teaching of the many subspecialty areas in Radiology)

(2) Radiology #999 (Research in Radiology)

(3) Masters Degree Program-six degrees awarded during the period. (see page 23)

C. Special Awards to Faculty Members

The following special awards were given to faculty members of the Department of Radiology between 1958 and 1968.

Drs. William Molnar, Sidney Nelson, Karl Klassen and Joseph Ryan were awarded the bronze medal for their exhibit on "Aortic Valvulography and Ascending Aortography" at the Ohio State Medical Association on April, 1958, in Columbus, Ohio. (This exhibit had previously won a magna cum laude award at the Radiological Society of North America in 1957)

Drs. Atis K. Freimanis, William Molnar and Thomas Frye were awarded the magna cum laude for scientific exhibit on "Bronchographic Demonstration of Chronic Bronchitis and Emphysema" at the 44th annual meeting of the Radiological Society of North America, in 1958, at Atlantic City, New Jersey.

Drs. William Molnar and C. V. Meckstroth were awarded the Certificate of Merit for their exhibit on "Thoracic Aortography" at the 44th Clinical Congress of the American College of Surgeons in September, 1958, at Atlantic City, New Jersey.

Drs. William Pace, William Molnar and Karl Klassen were awarded the Gold Medal for scientific exhibit on "Steering Wheel Injury of the Chest", at the Ohio State Medical Association, on April, 1959, in Columbus, Ohio.

Dr. William G. Myers was elected President of the Ohio State Chapter of Sigma Xi in May, 1959.

Dr. William Molnar was awarded the Certificate of Merit for the exhibit on "Bronchography: Diagnosis of Localized Peripheral Lesion", at the 62nd annual meeting of the American Roentgen Ray Society, in September, 1961, at Miami Beach, Florida.

Dr. Sidney W. Nelson was made a Fellow of the American College of Radiology at the Convocation in New York in 1962.

Dr. Paul D. Meyers was made a Fellow of the American College of Radiology at the Convocation in New York in 1962.

Dr. William Molnar was made a Fellow of the American College of Radiology at the Convocation in Tucson, Arizona in 1963.

Dr. Frank Riebel was made a Fellow in the American College of Radiology at the Convocation in Tucson, Arizona, in 1964.

Dr. Robert Friedman was made a Fellow of the American College of Radiology at the Convocation in Tucson, Arizona in 1964.

Dr. Sidney W. Nelson was the Freedman Lecturer at the University of Cincinnati in 1965.

Dr. Sidney W. Nelson was elected the President of the Association of University Radiologists in 1965-66. (The College of Medicine and the Department of Radiology was subsequently honored by being the host of the 16th annual meeting of the Association of University Radiologists in May, 1968.)

Dr. Sidney W. Nelson was an examiner on the American Board of Radiology 1958-1968.

Dr. Sidney W. Nelson was the quest editor for the Radiological Clinics for North America in 1966.

Dr. William G. Myers received the James Ewing Award of New York in June, 1966.

Dr. William Molnar and Edward Cousins were awarded the Bronze award for "Selective Coronary Angiography" exhibit at the Ohio State Medical Association meeting, in May, 1967.

Drs. James Kilman, William Molnar and Karl Klassen were awarded the Silver Award for the "Pulmonary Embolus-Diagnostic and Surgical Approach" exhibit at the Ohio State Medical Association meeting in May, 1967.

Dr. Xavier J. Riccobono was awarded the first prize by the Ohio State Medical Association for his exhibit entitled "Massive Pulmonary Embolus-Diagnostic or Surgical Approach", in May, 1967.

Dr. Sidney W. Nelson was appointed Consultant to the Armed Forces Institute of Pathology, Washington, D. C., 1967.

Dr. A. C. Christoforidis was made a Fellow of the American College of Radiology at the Convocation in Atlanta, Georgia, in 1968.

Dr. Atis K. Freimanis was named the "Man of the Year" by the graduating medical class of 1968.

Dr. Sidney W. Nelson in 1968 was made a Trustee of the American Board of Radiology by the American Roentgen Ray Society.

The following members of the department of radiology faculty were visiting professors at other universities during the 1958-1968 decade:

(1)	Dr. Sidney W. Nelson	University of Oregon	1964
(2)	Dr. Sidney W. Nelson	University of Washington	1964
(3)	Dr. Sidney W. Nelson	Temple University	1965
(4)	Dr. Sidney W. Nelson	New York University	1967
(5)	Dr. Sidney W. Nelson	University of Wisconsin	1967
(6)	Dr. William Molnar	Indiana University	1967
(7)	Dr. William Molnar	Medical College of New Jersey	1967
(8)	Dr. Atis K. Freimanis	University of Iowa	1968

II. Research

A. Research interests of faculty.

During this decade, attention was focused on the potential applicability of several radioisotopes in "Nuclear" Medicine and Dr. William G. Myers performed many original investigations relating to this rapidly expanding field.

Chromium-51 gamma-ray sources, in the form of small cylinders of "radiation chemotherapy," were first described by Dr. Myers to The American Radium Society in 1958. The advantages of such interstitial sources of gamma radiation were also considered in some detail, along with those of Cobalt-60 and Gold-198, in an invited lecture by Dr. Myers later published in the Transactions of the International Congress of Radiology in 1959, in Munich. These Chromium-51 cylinders are being used now in The Department of Radiology of The University of Chicago. Atomic Energy of Canada Limited is said to be starting to make them available commercially.

Radioiodine-125 was introduced by Dr. Myers in 1960 as an outgrowth of the M. Sc. Thesis in 1959 of one of his graduate students, J. C. Vanderleeden. Ten papers on I-125 have been published from Dr. Myers laboratory and the hundreds of papers published from scores of other laboratories since 1960 indicate that I-125 is the most diversely applicable radioisotope in Nuclear Medicine.

Dr. Myers also performed the original investigation on Radioiodine-121 which has many potential advantages because of its 2.1-hour halflife and the favorable radiations it emits, as indicated in his publications in 1965-66. Its usefulness will be apparent when small "medical" cyclotrons become located within large hospitals.

Radioiodine-126 was also investigated by Dr. Myers because of its value for multiple labelling potential made possible by its 13-day half-life. Calculations published in 1965 and 1966 revealed that I-125 readily may be made from I-125 in high flux reactors. (See over.)

Strontium-87m was introduced by Dr. Myers in 1960 as an advantageous ersatz calcium "γ- isotope" for in vivo studies of bone-salt metabolism. A system was developed for obtaining it conveniently and in high purity by "milking" it from relatively long-lived Yttrium-87 (made in the OSU cyclotron). These Y-87 generators now are being manufactured and sold worldwide by one American and two European suppliers. Strontium-87m was used in studies of healing bone fractures in the M. Sc. Thesis of Doctor Michael Olejar in 1963. Since then, Sr-87m gradually has become increasingly widely used for bone scanning, particularly in cancer.

Dr. Myers' investigations of Strontium-85m indicates that it has even better physical properties for bone scanning and he described this in 1966. However, its general applicability is not likely to become feasible until high neutron fluxes become available.

Radiocarbon-11 for scanning was introduced in 1967. It was made in the OSU cyclotron, and was found to accumulate in bone tumors in dogs to a degree adequate to demonstrate their presence and extent by external scanning. Many ^{11}C-compounds have been synthesized in this laboratory during 1958-68. Although it is projected that they should have exceptionally great promise for "Nuclear" Medicine, demonstrations of the usefulness of them awaits the availability of a modern "medical" cyclotron and suitable scanners.

The first commercially-produced scintillation camera was installed in

Radioiodine-123 was introduced in 1962. Because of greatly decreased radiation exposures when I-123 is substituted for I-131, as well as improved scanning resolution attainable with I-123, a joint all-out endeavor to make I-123 generally available currently is being pursued by HEW-AEC.

Dr Myers' laboratory in 1962. Studies of dynamic processes in vivo were described in a paper prepared at the invitation of The United States Atomic Energy Commission and delivered by Dr. Myers at the Symposium on "Medical Radioisotope Scanning" under the auspices of the International Atomic Energy Agency, in Athens, Greece, in 1964. Since then, more than 500 larger and improved versions of the scintillation camera have been installed in hospitals throughout much of the World where they are confirming their applicability for making dynamic studies by "inside-out" fluoroscopy, a term coined by Dr. Myers to describe this method of studying physio-pathologic processes.

The development and fabrication of new fluoroscopic and spot filming equipment was continued by Dr. Sidney W. Nelson, The Department Chairman. This equipment makes possible the teaching of the best fluoroscopic and spot filming techniques. Dr. Nelson's accurate phototiming system enabled radiology faculty members to concentrate entirely upon the teaching and patient care problems, precluding pre-occupation with exposure techniques because the radiographic exposures were automatically terminated when the spot films were of the proper density. This is in contrast to the more laborious and less accurate motor timing techniques. Furthermore, the precise collomination of the primary beam of radiation both at the point of emergence from the X-ray tube diaphragm and as it reached the spot film tunnel resulted in spot films of the highest quality with an absolute minimum of the secondary scatter thus avoiding unnecessary radiation exposure to the patient and the radiologist.

In 1958-1959 Drs. Nelson, Molnar and Christoforides developed a method of coronary arteriography utilizing the transcarotid approach. This was preceeded

by the development of a similar method for the study of the function of the aortic valve in patients suspected of having aortic insufficiency as a component of mitral valvular disease. Both of these methods were subsequently utilized extensively in the evaluation of many patients prior to contemplated cardiovascular operations. Exhibits of this method were shown at many national radiological meetings. (See "Awards and Honors")

During this decade Dr. Molnar, in collaboration with Drs. David Dunbar and Robert Mounts perfected many new methods of selectively catheterizing individual smaller arteries which heretofore were extremely difficult to study; e.g., coronary arteries, renal arteries, celiac arteries and superior and inferior mesenteric arteries. These techniques permitted an entirely new approach to the precise evaluation of diseases of the heart, liver, pancreas, kidneys, and intestines. During this period, Dr. Molnar and his team also worked diligently to develop methods of pulmonary arteriography in dogs, later applying the new method to the study of suspected diseases of the pulmonary valves and pulmonary arterial system in patients.

More recently, Dr. Molnar became interested in selective catheterization studies of the left ventricle for the purpose of studying the function of the mitral and aortic valves. His work in this area has resulted in a better understanding of the physiology of aortic subvalvular stenosis and new concepts of mitral valve function in various disease states characterized by congenital or acquired elongation of the chordae tendineae. These research studies have been documented with cine-radiographic studies which provide valuable teaching movies of the structure and function of these heart valves during normal and abnormal states.

Dr. Christoforidis, working in collaboration with Dr. Neil Andrews of the Department of Thoracic surgery has carried out investigations of relocations of tracheo-bronchial structures and lung lobes following atelectasis due to various types of pathological obstruction and also following operative resection. These studies have done much to help clarify the radiological appearances seen at bronchography when such conditions are present. Dr. Christoforidis also worked with Dr. Phil Pratt of the Department of Pathology, and Dr. Joseph Tomashefski of the Department of Medicine in the Development of Radiological Methods for Assessing Pulmonary Emphysema. These methods of evaluation have received national recognitition because of their accuracy, and are now being employed routinely in the detection of this increasingly common disease before it has produced too much unrepairable lung damage.

Drs. Nelson and Christoforidis have collaborated extensively in the evaluation of new bronchographic contrast media. These studies proved that barium sulfate was entirely safe in the tracheo-bronchial tree in contrast to previous erroneous beliefs. It is hoped that this knowledge will lead to the use of barium sulfate as a bronchographic contrast media since it now appears to be the safest of all of these available. These studies which were carried out in animals were done in collaboration with Dr. Phil Pratt of the Department of Pathology.

Drs. Nelson and Christoforidis, working in collaboration with Dr. William Reonigk of the College of Veterinary Medicine also carried out extensive animal investigations concerning the effects of barium sulfate and water soluble iodinated media. It was followed by fewer deleterious phenomena and resulted in a much

higher degree of diagnostic accuracy. These studies furnished a valuable lead to further investigations of these acute diseases of the small intestine which either simulate or are associated with actual mechanical obstruction. These disease states had not been previously studied routinely with opaque contrast media, but are now being studied in this fashion more routinely in this country.

More recently Drs. Nelson and Christoforidis, in collaboration with Drs. William Roenigk and Ralph Slusher of the Department of Veterinary Medicine have investigated the roentgenological manifestations of various vascular diseases of the gastrointestinal tract as shown following the administration of barium sulfate or the water soluble iodinated media into the lumen of the diseased part of the gastrointestinal tract. The studies are still in progress, and hopefully will clarify some of the early, and hitherto unknown manifestations of diseases which produce an impairment of the vascular supply of the intestine.

Dr. Atis K. Freimanis as the head of a team including a senior medical student (Dr. Mike Asher), Dr. Frank Batley, Dr. C. David Schloss and Dr. Ed Medina, began to investigate the diagnosis of retroperitoneal diseases by utilizing ultrasound methods. His studies have proven that ultrasound is an extremely valuable adjunct for the evaluation of diseases suspected in the retroperitoneal area, which had heretofore been relatively inaccessible to successful diagnostic study by conventional radiological methods. Dr. Freimanis also investigated the use of ultrasonic techniques in the study of diseases of the liver. The ultrasonic method has been found to be a uniquely reliable nondestructive diagnostic method and it appears that it will be increasingly utilized in the future for many other purposes.

Dr. Freimanis together with Drs. David Dunbar and other members of the faculty, has also been improvising newer methods of teaching medical students. His work in this important area has resulted in the development of several highly effective innovations which have stimulated a great deal of interest in other university radiology departments concerned with the improvement of teaching radiology to medical students.

Dr. Thomas E. Pomoroy during this decade continued his basic and important investigations of the factors which alter the host resistence during the time cancers are being treated with radiation and other forms of chemotherapy. His studies provided a stimulus for physicians who treat cancer patients to carefully evaluate the ability of the cancer patient to tolerate strenuous forms of therapy. His results indicate that certain patients have a better chance of cure if the cancer is treated with more skillfully planned, but less strenuous forms of therapy which permit the patients own defense mechanisms to operate more effectively than they would if they were seriously impaired by radical and strenuous forms of cancer therapy.

Dr. Pomoroy's interest in the biology of cancer cells caused him to be among the first to develop an interest in hyperbaric oxygen therapy. Accordingly, in collaboration with Dr. Charles D. Schloss he designed and started to use a hyperbaric oxygen facility in 1966. It is known that cancer cells with an adequate oxygen supply are considerably more sensitive to radiation than when they have an inadequate oxygen supply. Since many cancers are poorly oxygenated due to a poor blood supply, it is hoped that hyperbaric therapy will result in better control of certain forms of cancer.

Dr. C. David Schloss also collaborated with members of the dental faculty in studying the effects of radiation on the teeth in the formation of radiation caries. These appear to be secondary to changes in the chemistry of the saliva because of the difference in salivary gland secretions due to the effect of radiation on the salivary glands.

Dr. J. David Dunbar in collaboration with Dr. Zeph Hollenback of the Department of Obstretics and Gynecology performed animal studies attempting to determine the difference in the healing of radiated tissues containing absorbable suture material as compared to tissue in which cotton and silk sutures had been used following abdominal operations. This investigation hopes to determine if certain suture materials are preferable to others if post operative radiation is to be employed.

Dr. Vivian Harris carried out interesting investigations regarding the measurements of normal and abnormal retroperitoneal area as determined by the barium filled stomach and duodenum. A wide variety of normal patients and patients with various hematological diseases frequently accompanied by retroperitoneal involvement were evaluated. Dr. Harris, in collaboration with Dr. Willard Harris of the Department of Medicine, also investigated the effect of heart rate on heart size.

Dr. Xavier J. Riccobono developed new methods of radioactive isotope scanning of the pancreas in the new nuclear medicine laboratory. This method has been a great value in detecting neoplastic and other diseases of the pancreas, as well as in the differential diagnosis of these diseases. Dr. Riccobono and his colleagues have also carried out extensive investigations utilizing radioactive isotopic methods in the study of subdural hematomata.

B. Graduate student participation in research

1. Anthimos J. Christoforidis, M. D. participated in a research project involving the experimental production of bronchial distruction in dogs and the subsequent chronologic development of the rentogenological appearance due to the collapse of vari ous lobes of the lung. This research project formed the subject of his Masters Thesis entitled, "Radiological Manifestations of Endobronchial Obstruction. Experimental Study of Dogs."

2. Juergen Max Schroeer received his Masters Degree in 1958, his Thesis was entitled, "The Production of Carbon-11 in the Cyclotron and its Chemical Separation." This work was supervised jointly with Prof. Philip S. Jastram, in the Department of Physics.

3. Johannes Cornelis Vanderleeden received his Masters Degree in 1959, his Thesis was entitled, "Development of Counting Techniques for Low Energy Gamma Radiation for Application in Biology." Radioiodine-125 was the nuclide used in this study, which disclosed the earliest application of I-125 in biology and medicine. This work also was supervised jointly by William G. Myers and Professor Jastram in the Department of Physics.

4. Ellis Madison Hall, a graduate student in the Department of Veterinary Medicine performed a research project under the joint auspices of the radiology and surgery departments of the College of Veterinary Medicine and the Department of Radiology of the College of Medicine. This project involved the study of poorly understood periosteal reactions in growing puppies. This resulted in new information regarding the etiology of this phenomenon and provides important data in future studies in man! This lead to his Masters Thesis entitled "Hypertrophic Osteo-

arthropathy in Dogs Including a Radiographic Survey of 900 Clinical Cases at O. S. U." which was awarded in 1959.

5. Michael Olejar, M. D. received is Masters Degree in 1963, his Thesis was entitled, "Radiostrontium-87m in Studies of Healing Fractures." Dr. Myers served as Dr. Olejar's adviser in the Department of Physiology. The ^{87}Y-Sr^{87m} elution system used in this study was a modification of one developed in Dr. Myers' laboratory in 1959. The small amounts of Y-87 used in these studies was generated in the O. S. U. cyclotron.

6. Joel Edward Lichtenstein received in Masters Degree in 1966, his Thesis was entitled, "In Vivo Localization of Radioisotopes That Emit Both Gamma-Rays and X-Rays." Dr. William G. Myers and Professor E. Milton Boone of the Department of Electrical Engineering were the were the advisers. The medical studies in this thesis involved the use of Radioiodine-123. Mr. Lichtenstein presently is a first-year medical student here.

C. Financial support for research projects.

Among the organizations giving financial support to the Department of Radiology Research efforts are the following:

(1) Central Ohio Heart Association,

(2) Akron Heart Association,

(3) National Institutes of Health,

(4) Federal Aviation Agency,

(5) American Cancer Society,

(6) United States Public Health Service,

(7) The Ohio Tuberculosis Association,

(8) The Roessler Foundation,

(9) Winthrop Pharmaceutical Company,

(10) Astra Corporation.

D. Publications.

1958	11 Publications.
1959	12 Publications.
1960	22 Publications.
1961	17 Publications.
1962	18 Publications.
1963	12 Publications.
1964	11 Publications.
1965	11 Publications.
1966	26 Publications.
1967	13 Publications.
1968	15 Publications.
Total	168 Publications.

In addition to these publications, the radiology faculty gave stimulating presentations in more than 300 occasions at international, national, regional, and state meetings of various scientific organizations and at other universities in the United States and abroad.

Department of Radiology
History for Decade 1958-1968

II. Updated Biographies of Faculty (Radiology)

Personnel 1958-1968

Allen, John R. — see Dept. of Pathology

Batley, Frank
B. Sc., Manchester U., England 1941; M. B. and Ch. B., Manchester U. 1944; Asst. Prof. 1956; Assoc. Prof., Queens Univ., Canada, 1957-59; Assoc. Prof., Upstate Med. Ctr., Syracuse, N. Y., 1959-67; Prof. OSU, 1967-.

Blazek, James V.
B. A., Univ. of Iowa, 1956; M. D., Univ. of Iowa, 1956; Instr.-Asst. Prof. Johns Hopkins Univ., Baltimore, Md., 1963-67, Asst. Prof. OSU, 1968-.

Callendine, George W.
B. Sc., Bethany Coll. 1943; M. Sc., OSU, 1948; Ph. D., OSU, 1954; Asst. Prof. 1954-.

Carter, William H.
M. D., OSU, 1939; Instr. 1958; Asst. Prof. 1951-.

Christoforidis, Anthimos J.
M. D., National Univ. of Athens, 1959; M. M. Sc., OSU, 1957; Instr. OSU, 1956-59 Asst. Prof., OSU, 1959-61; Assoc. Prof., OSU, 1961-66; Prof. OSU, 1966-.

Cook, William T.
A. B., Harvard Univ., 1958; M. D., Univ. of Chicago, 1957; Asst. Prof., OSU, 1961-62.

Dunbar, J. David
B. S., OSU, 1951; M. D., OSU, 1955; Asst. Prof., OSU, 1962-67; Assoc. Prof. OSU, 1967-.

Eggleston, William D.
M. D., OSU, 1956; Asst. Prof., OSU, 1962-63.

Elston, Matthew W.
B. A., Colgate U., 1959; M. D., OSU, 1959; Instr. 1956; Asst. Prof. 1957-61.

Fink, Howard E., Jr.
B. A., Univ. of Buffalo, 1954; M. D. State Univ. of N. Y. Med. School (Syracuse) 1955; Asst. Prof., OSU., 1962-63.

Flevares, Constantine W.
B. A., 1957, B. S., 1959, Univ. of South Dakota, M. D., Marquette Univ., Milwaukee, Wisc. 1961; Instr. 1965-67, Asst. Prof., 1967-68.

Freimanis, Atis K.
M. D., Univ. of Hamburg, Ger., 1951; Instr., OSU, 1958-59; Asst. Prof. OSU, 1959-61; Assoc. Prof., OSU, 1961-56; Prof. OSU, 1965-.

Freidman, Robert L.
B. Sc., New York U., 1934; M. D., School of Medical Royal Colleges, Edinburgh, Schotland 1940; Asst. Prof. 1954-.

Fulton, Juston F.
B. A., OSU, 1923; M. D., OSU, 1925; Asst. Prof. 1927-67 (d. 1967).

Frye, Thomas R.
B. A., OSU, 1950, M. D., OSU, 1954; Instr., OSU, 1959-62, Asst. Prof. 1962-.

Graves, Grant O. see Dept. of Anatomy

Goldstein, Morton I.
A. B., Univ. of Rochester, 1954; M. D. State Univ. of N. Y. (Syracuse) 1958; Instr. OSU, 1967-68; Asst. Prof., OSU, 1968-.

Gutman, Emil M.
B. S., Battle Creek College, 1933; M. D., Univ. of Illinois, 1939; Asst. Prof. 1968-.

Haralombopoulos, Angelo
M. D., Univ. of Athens, Greece, 1943; Instr., OSU, 1956-58; Asst. Prof. 1958-62

Harris, Vivian J.
M. A., Univ. of California (Berkley) 1951; M. D., Bellevue, N. Y. Univ., 1955; Asst. Prof., OSU, 1963-68.

Howard, William H. R.
A. B., OSU., 1938; M. D., Western Reserve U. 1942; Instr. 1946; Asst. Prof. 1952; Assoc. Prof. 1958-68; Prof. 1968-.

Kartha, Mukunda K. Physicist
B. Sc., Kerala Univ., India, 1958; M. P., Saugi Univ., India, 1961; Ph. D., Univ. of Western Ontario, Canada, 1968; Asst. Prof., OSU, 1968-.

Kirkendall, Ben R.
M. D., SMC., 1905; Instr. 1940; Asst. Prof. 1942; Assoc. Prof. 1943-55; Emer. Assoc. Prof., 1955-68 (d. 1968).

Kirkendall, Edward T.
B. Sc., OSU, 1914; M. Sc., OSU, 1916; M. D., OSU, 1926; Instr. 1933-40; Asst. Prof. 1946-52; (1952-d).

Means, Hugh J.
B. A., OSU, 1906; M. D., U. of Pennsylvania 1908; Asst. Prof., 1932, Assoc. Prof. 1936, Prof. 1940, Department of Surgery (Roentgenology); Director of Radiology Laboratory, Starling Loving and University Hospitals, 1937-53; Prof. and Chr. Department of Radiology, 1947-53; Emer. Prof. 1953-.1971.

Meyer, Paul D.
B. A., OSU, 1930; M. D., OSU, 1935; Instr. 1948; Asst. Prof. 1954-66. (d. 1966)

Molnar, William
M. D., Medical U. of Budapest 1942; Asst. Prof., 1954-57; Assoc. Prof. OSU, 1957-61; Prof., OSU, 1961-.

Mounts, Robert J.
B. A., OSU, 1951; M. D., OSU, 1956; Asst. Prof., OSU, 1964-.

Myers, William G.
M. Sc., OSU, 1937; Ph. D., OSU, 1939; M. D., OSU, 1941; Res. Assoc. Prof. 1949-53; Research Prof. 1953-66; Prof., 1966-.

Nelson, Sidney W.
B. S., U. of Washington, 1942; M. D., Northwestern U., 1946; Prof. and Chr. 1955-; Director of Radiology, University Hospitals, 1955-.

Plaut, Hans, F. M.
M. D., U. of Leipzig, Germany, 1922; Asst. Prof. 1956-67 (d. 1967).

Pomeroy, Thomas C.
M. D., OSU, 1943; Asst. Prof. 1957; Assoc. Prof. 1958-61; Prof. 1961-67.

Riccobono, Xavier J.
M. D., State Univ. of N. Y. (Downstate), 1948; Instr., OSU, 1959-64; Asst. Prof., 1964-69; Assoc. Prof. 1969-.

Riebel, Frank A.
B. Sc., OSU, 1925; M. D., OSU, 1925; Instr. 1952-64; Asst. Prof., 1964-.

Roenigk, William J.
D. V. M., OSU, 1954; M. Sc., Baylor Univ., 1958; Asst. Prof., 1959-62; Assoc. Prof., 1962-65.

Schimert, Arnd P.
M. D., Royal Hungary Scientific Univ., 1959; Instr. 1958-60; Asst. Prof., 1960-61.

Schloss, C. David
B. S., The Citadel, 1954; M. D., Jefferson Med. College, 1958; Instr. 1964-65; Asst. Prof. 1965-69, Assoc. Prof. 1969-.

Sopp, Theodore E. Physicist
B. Sc., in E. E., Drexel Inst. of Technology, 1946; M. S., Drexel Inst. of Technology, 1959; Instr. 1958; Asst. Prof., 1959-69, Assoc. Prof. 1969-.

Stevens, Walton E.
A. B., Johns Hopkins Univ., 1943; M. D., Temple Univ., 1948; Asst. Prof. 1963-64.

Stockum, Alfred E.
B. S., OSU, 1953; M. D., OSU, 1958, Asst. Prof. 1965-.

Weber, Stephen W.
A. B., Kent State Univ. 1957; M. D., OSU, 1961; Instr. 1965-66; Asst. Prof. 1966-

Instructors

Briggs, William E.
B. A., M. D., Inst. 1960-.

Bruns, Robert F.
B. S., M. D.; 1966-67.

Cohen, Arthur R.
A. R., M. D.; 1954-.

Dare, Jerome G.
A. B., Univ. of Calif., 1959, Instr. OSU, 1963-.

DeLeon, Erlinda F.
M. D., Far Eastern Univ., Manila, Philippines, 1957; Instr., 1962-63.

Dotter, John F.
B. Sc., M. D.; 1964-.

Eraso, Servio T.
M. D., Universidad Nacional of Colombia, 1954; Instr., OSU, 1960-61.

Fox, Thomas R.
M. D., 1948-.

Garnica, Tomas S.
M. D., Madrid Univ., Spain, 1962; Instr. 1967-68.

Gordon, Michael B.
B. A., M. D.; 1968-69.

Hughes, Martha P.
B. S., B. C. S., R. T.; 1953-61.

Hunter, William W.
D. V. M., Instr. 1968-1969.

Hurst, Marion F.
M. D.; Instr. 1968-69.

Kaye, Joel E.
B. S., M. D.: inst. 1964-65.

Klecker, Richard L.
B. S., M. D.; Instr. 1966-.

Lawrence, Leslie J.
A. B., M. D.: Instr. 1969.

Long, Harold W.
M. D.; Instr. 1959-.

Magleby, Dale H.
M. D.; Instr. 1957-.

Manchester, James R.
M. D.; Instr. 1957-.

Meyer, Tearle L.
B. A., M. D.; Instr. 1967-.

Moores, Charles V.
M. D.; Instr. 1964-.

Paradis, Milo R. V.
M. D.; Instr. 1963-65.

Paul, Robert J.
M. D., Instr. 1964-65, Asst. Prof. 1965-66.

Putnam, Dale E.
M. D.; Instr. 1954-61.

Puterbaugh, Merlin S.
B. S., M. D.; Instr. 1/1/68-6/30/68.

Schmidt, Dana R.
M. D.; 1954-.

Southard, Ollie E.
B. S., M. D., Instr. 1958-.

Taylor, Gordon C.
B. S., M. D.; Instr. 1966-.

Wunder, Willis F.
B. S., M. D.; Instr. 1966-67.

Lecturers

Roenigk, William J.
D. V. M.

Warwick, Frederick
B. A., M. D., B. Ch.; Lect. 1/1/68 - 6/30/68.

"APPENDIX"

To be used if desired in more detailed publication of departmental history in O. S. U. College of Medicine.

Department of Radiology
History for Decade 1958-1968

Sidney W. Nelson, M. D.
William Molnar, M. D. (with K. Klassen and J. Ryan)

Aortic Valvulography and Ascending Aortography. Radiology 70:May 1958.

Sidney W. Nelson, M. D.

A technique for filling part two of the duodenum with particular reference to the improvement in roentgenographic demonstration of post-bulbar ulcers. American Journal of Roentgenology 79:May 1958.

Sidney W. Nelson, M. D.
A. J. Christoforidis, M. D.

Reversible Bronchiectasis. Radiology 71: September 1958.

Sidney W. Nelson, M. D.

Organoaxial volulus of the stomach. Am. J. Surg. 96:October 1958.

Sidney W. Nelson, M. D.

Spontaneous perforated esophagus. Am. J. Surg. 96: September 1958.

Sidney W. Nelson, M. D.

Gallstone ileus. Am. J. Surg. 96: November 1958.

Sidney W. Nelson, M. D.

Pneumatosis cystoides intestinalis. Am. J. Surg: December 1958.

William G. Myers, M. D.

The treatment of cancer with small sources of radioactive gold.
With U. K. Henschke and A. G. James.
Chap. 26 in: Treatment of Cancer and Allied Diseases. Vol. 1.
Second edition. Ed. by Pack and Ariel. Paul B. Hoeber, Inc., New York.,
1958.

William G. Myers, M. D.

"Scale-Of-One" Gamma-Icons. Pages 25-30, Collected papers. Symposium on Scintillation Scanning. U. S. Naval Medical Center, Bethesda, Maryland. October 4, 1958.

Department of Radiology
History for Decade 1958-1968

Frank A. Riebel, M. D.

Use of the eyes in X-ray diagnosis. Radiology 70: Feb. 1958.

William Molnar, M. D.
Frank A. Riebel, M. D.
Kenneth R. McCormack, M. D.

Splenic vein thrombosis. Radiology 70: May 1958.

Department of Radiology
History for Decade 1958-1968

Sidney W. Nelson, M. D.

Pseudodiverticulum of the colonic mucosa with acute and chronic inflammation and periocolic abscess formation. Am. J. Surg. 97:Feb. 1959.

A. J. Christoforidis, M. D. (with R. Browning)

Pulmonary tuberculosis associated with carcinoma of the lung. AMA Arch. Int. Med. 103:Feb. 1959.

Sidney W. Nelson, M. D.

Mid-small bowel obstruction secondary to adhesions. Am. J. Surg. 97: March 1959.

Sidney W. Nelson, M. D.

Huge right subphrenic abscess secondary to perforated peptic ulcer (gastric). Am. J. Surg. 97: June 1959.

Sidney W. Nelson, M. D.
A. J. Christoforidis, M. D. (with P. Pratt)

Barium sulfate and bismuth subcarbonate suspensions as bronchographic contrast media. Radiology 72: June 1959.

Thomas R. Frye, M. D.

Villous adenoma of the sigmoid colon. Radiology 73: July 1959.

Sidney W. Nelson, M. D.

Monteggia fracture-dislocation. Am. J. Surg. 98: July 1959.

William Molnar, M. D.
Sidney W. Nelson, M. D. with K. Klassenand J. Ryan)

Aortic valvulography and ascending aortography. AMA Arch. Surg. 79: October 1959.

A. J. Christoforidis, M. D. (with N. Andrews and P. Pratt)

Bronchogenic cysts in patients presumed to have pulmonary tuberculosis. Dis. Chest 36:October 1959.

Sidney W. Nelson, M. D.

Subcapsular encysted hematoma of the spleen. Am. J. Surg. 98: Nov. 1959.

William G. Myers, M. D.

Radioactive Chromium 51 Gamma Ray Sources. Am. J. Roentgenol. 81: January 1959.

Frank A. Riebel, M. D.

Eye glasses for the radiologist. Am. J. Roentgenol. 82: July 1959.

Department of Radiology
History f or Decade 1958-1968

Sidney W. Nelson, M. D.

Dissecting traumatic aneurysm of descending thoracic aorta. Am. J. Surg. 99:Jan. 1960.

Sidney W. Nelson, M. D.

Duodenal stenosis proximal to the ampulla of Vater. Am. J. Surg. 99: Jan. 1960.

Matthew W. Elson, M. D.

Antemortem radiographic demonstration of gas gangrene of the liver. Radiology 74: Jan. 1960.

Sidney W. Nelson, M. D.

Mechanical obstruction of the rectosigmoid due to endometriosis. Am. J. Surg. 99: Feb. 1960.

Sidney W. Nelson, M. D.

Large hyperplastic parathyroid gland. Am. J. Surg. 99: March 1960.

Sidney W. Nelson, M. D.
William Eggleston, M. D.

Findings on plain roentgenograms of the abdomen associated with mesenteric vascular occlusion with a possible new sign of mesenteric venous thrombosis. Am. J. Roentgenol. 83: May 1960.

A. J. Christoforidis, M. D.
William Molnar, M. D.

Eosinophilic pneumonia. Report of two cases with pulmonary biopsy. J. A. M. A. 173: May 1970.

Xavier J. Riccobono, M. D.

Gastroduodenal intussusception. Gastroenterology: June 1960.

Sidney W. Nelson, M. D.

Massive infarction of the jejunum and ileum due to mesenteric thrombosis and volvulus of the infarcted bowel. Am. J. Surg. 99: June 1960

A. J. Christoforidis, M. D. (with C. Britt and N. Andrews)

Bilateral simultaneous squamous cell carcinoma of the lung. J. Thor. and Cardiovas. Surg. 40:July 1960.

Department of Radi ology
History for Decade 1958-1968

Sidney W. Nelson, M. D.

Ectopic presacral kidney, left. Am. J. Surg. 100:July 1960.

Sidney W. Nelson, M. D.
William Molnar, M. D.
A. J. Christoforidis, M. D. (with C. Britt)

Coronary arteriography. Development of a method in animals with particular attention to physiologic effects. Radiology 75: July 1960.

William Molnar, M. D.
Sidney W. Nelson, M. D. (with C. Meckstroth and R. Booth)

Transarotid coronary arteriography in man with emphasis on intercoronary arterial anastomosis. Radiology 75: August 1960.

Sidney W. Nelson, M. D.

Ileocolic intussusception. Am. J. Surg. 100: Sept. 1960.

Sidney W. Nelson, M. D.

Coarctation of the aorta distal to a normally located left subclavian artery, but proximal to an ectopic right subclavian artery. Am. J. Surg. 100: Oct. 1960.

Sidney W. Nelson, M. D.

Large hiatus hernia with upside-down stomach. Am. J. Surg. 100:Nov. 1960.

William G. Myers, M. D. (with C. Diener)

EDTA-Cr-51 Gamma-ray "Carrier". J. Nuc. Med. 1:April 1960.

William G. Myers, M. D. (with H. Vanderleeden)

Radioiodine, I-125. J. Nuc. Med. 1:April 1960.

William G. Myers, M. D.

Radiostrontium-87m. J. Nuc. Med. 1:April 1960.

William G. Myers, M. D. (with H. Vanderleeden)

Radioiodine-125. J. Nuc. Med. 1: July 1960.

Department of Radiology
History for Decade 1958-1968

William G. Myers, M. D.

Artificaial Gamma Ray Sources for Interstitial Therapy. 9th Internat. Congree Radiology (Munich, 1959). Georg. Thieme Verlag. Stuttgart, 1960.

Robert L. Friedman, M. D.

Holoacardium acephalus. Radiology 75:1960.

Department of Radiology
History for Decade 1958-1968

J. D. Dunbar, M. D.
R. E. Melhem, M. D. (with R. Booth)

The "B" lines of Kerley and left atrial size in mitral valve disease. Radiology 76:January 1961.

Matthew W. Elson, M. D.

The syndrome of exophthalmos, hypertrophic osteoarthropathy, and pretibial myxedema. Am. J. Roentgenol. 85:Jan. 1961.

Sidney W. Nelson, M. D.

The importance of the upright position in cholecystography in the diagnosis of tiny radiolucent gallstones. Am. J. Surg. 101:Feb. 1961.

Sidney W. Nelson, M. D.

Mechanical obstruction of the small intestine due to simple band adhesion. Am. J. Surg. 101:March 1961.

A. J. Christoforidis, M. D. (with C. Britt and N. Andrews)

Asymptomatic spontaneous pneumoperitoneum. Am. J. Surg. 101:March 1961.

Sidney W. Nelson, M. D.

Multiple traumatic lesions of the bony pelvis. Am. J. Surg. 101:Apr. 1961.

William Molnar, M. D. (with V. Runco, C. Meckstroth, and J. Ryan)

The Graham Steel Murmur versus aortic regurgitation in rheumatic heart disease. Am. J. Medicine 31: July 1961.

Servio T. Eraso, M. D.

Roentgen and clinical diagnosis of glomus jugular tumors. Radiology 77:August 1961.

Sidney W. Nelson, M. D.

Traumatic pneumocephalus with air in the lateral cerebral ventricles. Am. J. Surg. 102:Sept. 1961.

William Molnar, M. D. (with others)

The clinical applications of coronary arteriography. J. A. M. A. Oct. 1961

Department of Radiology
History for Decade 1958-1968

William Molnar, M. D. (with others)

Supravalvular aortic stenosis. Clinical experiences with four patients including familial occurrence. Am. J. Medicine Nov. 1961.

Hans F. Plaut, M. D.

Monograph: Vertebral and carotid angiograms in tentorial herniations, including roentgen anatomy of the tentorial incisura. Charles C. Thomas, Publishers, Springfield, Illinois, 155 pages, 1961.

William G. Myers, M. D.

EDTA-Co* Gamma-ray "Carrier". J. Nuc. Med. 2:April 1961.

William G. Myers, M. D. (with P. Dettman)

Radioiodine-125 for clinical photon projection analysis. J. Nuc. Med. 2:April 1961.

William G. Myers, M. D. (with C. Winter)

Radioisotope renograms with 2, 6-Diiodosulfanilate-I^{131} as a test agent. J. Nuc. Med. 2:April 1961.

William G. Myers, M. D. (with P. Dettman)

Radioiodine-125 for evaluation of thyroid function. Surg. Forum 12:1961.

Robert L. Friedman, M. D.
Paul D. Meyer, M. D.

Intrafetal gas in utero. Am. J. Obst. & Gynec. 82: Dec. 1961.

Department of Radiology
History for Decade 1958-1968

Thomas R. Frye, M. D. (with others)

Total anomalous pulmonary venous return. Am. J. Dis. Children 101:Jan. 1962.

A. J. Christoforidis, M. D.
Sidney W. Nelson, M. D. (with J. Tomashefski)

Effects of bronchography on pulmonary fuction. Am. Rev. Respiratory Dis. 82:Jan. 1962.

A. K. Freimanis, M. D. (with Hunt, Meagher, and Rossel)

Angiographic studies in experimental intracranial hypertension. J. Neurosurg. 19:Jan. 1962.

Robert J. Mounts, M. D.
William Molnar, M. D.

The clinical evaluation of a new bronchographic contrast medium. Radiology Feb. 1962.

William Molnar, M. D. (with others)

Coronary arteriography utilizing the right common carotid artery approach. J. Thor. and Cardiovas. Surg. April 1962.

William Molnar, M. D. (with J. Prior)

Anesthesia for bronchography utilizing intermittent positive pressure. Am. J. Roentgenol. May 1962.

Sidney W. Nelson, M. D.

Marked degree of cardiospasm (achalasia) simulating many mediastinal diseases. Am. J. Surg. 103:May 1962.

Sidney W. Nelson, M. D.

Cecal volvulus. Am. J. Surg. 103:June 1962.

Thomas C. Pomeroy, M. D. (with J. Ullery)

Management of gynecologic cancer. Cancer 12:July-Aug. 1962.

Sidney W. Nelson, M. D.

Bronchial adenoma producing recurrent atelectasis and pneumonia of the right upper lobe. Am. J. Surg. 104:Oct. 1962.

Department of Radiology
History for Decade 1958-1968

A. J. Christoforidis, M. D.
Sidney W. Nelson, M. D. (with J. Tomashefski)

Oropharyngeal and tracheobronchial aerosol anesthesia. Dis. Chest. 42:1962.

William G. Myers, M. D. (with C. Winter)

Clinical use of I-125 in kidney function testing. OSU Health Center Journal Spring 1962, Vol. 12.

William G. Myers, M. D. (with H. Anger)

Radioiodine-123. Nuc. Medicine May 1962.

William G. Myers, M. D.

On a new source of X-rays. The Ohio State Med. Jour. 58:July 1962.

William G. Myers, M. D. (with C. Winter)

I-125, a new radioisotope for the labeled Hippuran renogram. J. Urology 88:July 1962.

William G. Myers, M. D. (with C. Winter)

Three new test agents for the radioisotope renogram: DISA-I^{131}; EDTA-Cr^{51}; and Hippuran-I-125. J. Nuc. Medicine 3:July 1962.

Frank A. Riebel, M. D. (with F. Cossu)

They have eyes: let them see. X-ray Technician 34: Sept. 1962.

A. J. Christoforidis, M. D. (with Andrews and Marshall)

Evaluation of segmental resection of the right upper lobe. Dis. Chest 42:July 1962.

Howard E. Fink, M. D. (with Oberman)

Hemangioendothelial cell sarcoma and hemangiopericytoma. Amer. J. Roentgenol. 89:Jan. 1963.

Sidney W. Nelson, M. D.
A. J. Christoforidis, M. D. (with Roenigk)

Barium suspensions vs. water-soluble iodine compounds in the study of obstruction of the small bowel. Radiology 80:Feb. 1963.

William Molnar, M. D.
Frank A. Riebel, M. D.

Bronchography: an aid in the diagnosis of peripheral pulmonary carcinoma. Rad. Clinics N. A. Aug. 1963.

Sidney W. Nelson, M. D.
Atis K. Freimanis, M. D.

Angiographic features of convexity subdural hematomas with emphasis on the differential diagnosis between unilateral and bilateral hematomas. Am. J. Roentgenol. 90:Sept. 1963.

Theodore E. Sopp, M. S.

Radiation Safety Manual. Procedures and Code of the Ohio State University.

Frank A. Riebel, M. D.

Abstracts from French literature for American Journal Roentgenology, per assignment.

Frank A. Riebel, M. D.

Review of Russian radiological literature and selection of articles for abstraction in Radiology.

William G. Myers, M. D.

Scintillation camera for in vivo studies of dynamic processes. J. Nuc. Med. 4:May 1963.

William G. Myers, M. D. (with Olejar)

Radiostrontium-87m in studies of healing bone fracture. J. Nuc. Med. 4:May 1963.

Department of Radiology
History for Decade 1958-1968

William G. Myers, M. D.

Comparisons of I-131, I-125, and I-123 for in vivo and in vitro applications in diagnosis. (7th Internat. Congress Int. Med., Munich, Sept. 1962) Georg Thieme Verlag, Stuttgart, 1963.

William G. Myers, M. D.

Discussion of papers of Symposium Progress in Medical Radioisotope Scanning - TID 7673 held at Oak Ridge Institute of Nuclear Studies in October 1962.

William G. Myers, M. D.

Discussion of papers of Symposium held at the Oak Ridge Institute of Nuclear Studies in October 1963.

Department of Radiology
History for Decade 1958-1968

Sidney W. Nelson, M. D.
A. J. Christoforidis, M. D.

An automatic inhalation-actuated aerosol anesthesia unit: a new method of applying topical anesthesia to the oropharynx and tracheobronchial tree. Radiology 82:Feb. 1964.

Atis K. Freimanis, M. D.
Sidney W. Nelson, M. D.

The chest roentgenogram in the diagnosis of acute abdominal disease. Rad. Clin. N. A. 2:April 1964.

Sidney W. Nelson, M. D.

Obstructive emphysema of the right main stem bronchus due to a foreign body (peanut). Am. J. Surg. 107:April 1964.

Sidney W. Nelson, M. D.
A. J. Christoforidis, M. D. (with P. C. Pratt)

Bronchiolar dilatation associated with muscular hyperplasia: polycystic lung. Emphasis on the roentgenologic findings. Am. J. Roentgenol. 92: Sept. 1964.

A. J. Christoforidis, M. D.
Sidney W. Nelson, M. D. (with P. C. Pratt)

A new sign for evaluating pulmonary cavities. The "Wall Sign." Radiology 83:Sept. 1964.

Sidney W. Nelson, M. D.
A. J. Christoforidis, M. D. (with P. C. Pratt)

Further experience with barium sulfate as a bronchographic contrast medium. Am. J. Roentgenol. 92:Sept. 1964.

Thomas R. Frye, M. D. (with Allen, Morse, and Clatworthy)

Vena cavagrams in infants and children. Annals of Surg. 160:Oct. 1964.

William Molnar, M. D.

Bronchography. Part I. Technic. Post-Grad. Med. (R diol. Sec.) 36:No. 3 Sept. 1964.

Department of Radiology
History for Decade 1958-1968

William Molnar, M. D.

Bronchography. Part II. Interpretation. Post-Grad. Med. (Radiol. Sec.) 36:No. 4, Oct. 1964.

William G. Myers, M. D.

Discussion of paper "Autofluorography with an X-ray image amplifier" by Ter-Pogossian and Eichling at Symposium on Medical Radioisotope Scanning During proceedings of Internat. Atom. Energy Agency, Athens, Greece, April, 1964.

William G. Myers, M. D.

Dynamic studies with a Gamma-ray scintillation camera. Interant. Atom. Energy Agency., Proceedings of symposium, Vienna, Oct. 1964.

Department of Radiology
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E. In addition to these publications, the radiology faculty gave stimulating presentations in more than 300 occasions at international, national, regional, and state meetings of various scientific organizations and at other universities in the United States and abroad.